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Handbook

Cars are a fact of life. Most of us can't live without one. But they are expensive to operate, and they are one of the world's single greatest sources of environmental pollution. The good news? If you buy, drive, and maintain your car using the simple guidelines in this handbook, you'll save a surprising amount of money while helping the environment.

It's all about being Auto\$mart.

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Join the Auto\$mart Movement

Everyone wants to save money. By being Auto\$mart, you will save money while contributing to a healthier environment. That's what this guide is about. It contains practical tips for improved automobile efficiency that require little effort yet pay big dividends. Pull it out. Save it. Use it. Being Auto\$mart is like getting paid to do the environment a favour.

As any financial planner will tell you, the most reliable way to build wealth is by saving and investing money in regular amounts. A relatively modest sum invested carefully month after month will produce real wealth over a lifetime.

The same logic applies to expenses. Reduce costs even a little and the savings will eventually accumulate into a significant amount of money.

Being Auto\$mart is a way to "earn" those savings from your car.

For most Canadians, car ownership is one of their largest expenses. Fuel can easily cost more than \$1,000 a year. Older cars usually need repairs costing at least that much. And there's depreciation, insurance, and licensing – potentially thousands of dollars more.

Cars are also a cost to the environment. A growing number of Canadian cities have unhealthy air mainly because of vehicle exhaust. Smog is the biggest problem. Also known as "ground-level ozone," it forms when nitrogen oxides emitted by motor vehicles combine in

hot sunlight with fumes that evaporate from unburned gasoline, paints, and solvents. Smog harms people's lungs and eyes (children are especially susceptible), and it damages trees and crops. Car exhaust also contributes to acid rain, which damages plants and accelerates the decay of buildings. Carbon dioxide (CO₂) from vehicles is a major contributor to global warming. About 30% of Canada's CO₂ emissions come from vehicles, mostly personal cars and light-duty trucks.

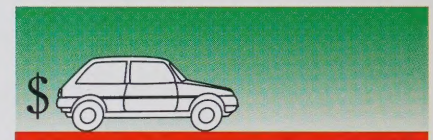
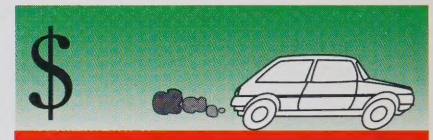
The link is obvious: fuel use has a direct impact on our health, the health of our environment, and our personal finances.

But aren't cars more fuel efficient than ever? Yes. Fuel consumption has been dramatically lowered since the early 1970s because of technological improvements and fuel consumption standards. The problem is that total fuel use is rising because there are many more cars on the road – 13.3 million in Canada alone. And we are travelling farther and more often than before.

Every year, Canadians add more than 50 million tonnes of CO₂ to the atmosphere. The only way to reduce this massive amount is through the cumulative efforts of many Canadian drivers. Consider the

benefits: if 10 million drivers got Auto\$mart and reduced their fuel consumption by just one-fifth, the atmosphere would be spared over 10 million tonnes of carbon dioxide every year. Plus, each

driver would annually save more than \$300. Invested wisely in an RRSP for 25 or 30 years, or in a child's education fund, that small annual saving becomes a meaningful amount of money.



By accelerating rapidly from a stop, you can consume as much as 50% more fuel than if you pull away gradually. Catalytic converters cannot handle the sudden surge so they permit more pollutants out the tailpipe.

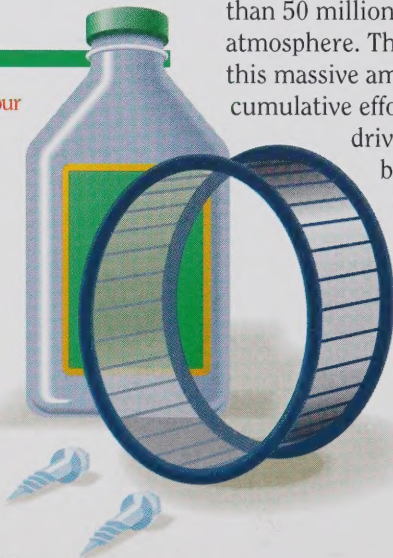
Being Auto\$mart is based on three simple strategies: Buy Auto\$mart. Drive Auto\$mart. Stay Auto\$mart.

Buy Auto\$mart

It makes sense to purchase the most fuel-efficient car you can find, relative to your needs. Cars tend to be on the road for 10 to 15 years. By purchasing a car with high fuel demand, you are "committing" the environment to the emissions that a car will produce for all those years.

Consider buying only as much car as you need. Drivers who rarely travel long distances or carry large loads don't really need a large car. When choosing options, know that air conditioners impose an extra load on the engine, making it work harder and burn more fuel. Certain common options, like power windows and power seats, add weight that also makes the

The least expensive parts of your automobile are things like spark plugs, the air filter, oil filter, and consumables such as motor oil and radiator fluid. Yet ensuring they are replaced regularly will save you hundreds, if not thousands, of dollars in repair bills; especially as the car ages. Preventive maintenance also saves fuel and reduces harmful emissions.



engine less efficient. On the other hand, cruise control, fuel injection, radial tires, and a block heater (with a timer) help conserve fuel.

Aerodynamics are also important. Sleeker vehicles (especially those with tapered front ends) impose less aerodynamic drag and therefore require less energy to "push" through the air. Blunt-nosed vehicles, and options such as roof racks and side windows on pickup trucks, cause more drag and use more fuel.

Vehicle manufacturers are required to label every new vehicle with a fuel-consumption rating. When shopping for a car, look for this number. If it's not visible, ask the dealer or refer to *The Fuel Consumption Guide*, a free publication from Natural Resources Canada and Transport Canada that contains the ratings of all new cars and light-duty trucks sold in Canada.

Drive Auto\$mart

By driving Auto\$mart, you will use less fuel to travel the same number of kilometres. The hidden benefit of these fuel-saving techniques is less wear and tear on your car, which means fewer and lower repair bills.

The first thing to remember is that when your car is idling you are wasting fuel – one-tenth of a litre every 10 minutes; 250 grams of CO₂ released into the atmosphere. Turn the car off when parked for extended periods. And don't idle to warm the engine for more than a minute. Idling is no better mechanically for your car than driving slowly. And it's much worse for the environment.

Cold is a definite problem. Engines don't burn fuel efficiently until they reach their normal operating temperature, and catalytic converters aren't efficient at burning exhaust gases until they reach a temperature of several hundred degrees Celsius. This means a substantial amount of pollution is emitted during the first few minutes of any trip. Using a block heater with a timer when temperatures drop below freezing will give your engine a head start toward reaching its prime operating temperature. Always try to plan outings that combine several errands into one trip.

Fewer trips means fewer cold starts, less fuel, and less pollution.

Other sensible Auto\$mart driving tips:

- Avoid pulling away abruptly from a stop. It wastes fuel and doesn't get you to your destination any faster.

- Try not to brake unnecessarily or ride the brakes. You lose momentum.

- Avoid speeding.

Vehicles get better mileage at lower speeds (a car going 110 km/hr consumes about 20% more fuel than one travelling 90 km/hr).

- Avoid traffic as much as possible by driving during non-peak hours.

- Try to anticipate the flow of traffic around you. You'll do less stopping and starting.

- Avoid carrying extra weight in your car, like bags of salt or heavy power tools. Lighter cars use less fuel.

Finally, consider Auto\$mart alternatives to driving your car. Public transit or ride sharing for only

The Auto\$mart Checkup ✓

The following is a general maintenance guide for all cars. Refer to your owner's manual for the specific maintenance schedule recommended by the manufacturer.

Bi-weekly

- ☐ Check engine oil, brake fluid, radiator fluid
- ☐ Inspect tires for wear and check the pressure (monthly)

Every 3 months

(or every 4,000 to 6,000 km in addition to the bi-weekly inspections)

- ☐ Change oil and filter

Every 6 months

(in addition to the 3-month items)

- ☐ Minor tune-up
- ☐ Check belts and hoses
- ☐ Check all fluid levels
- ☐ Replace air filter
- ☐ Check tires for wear; rotate if needed

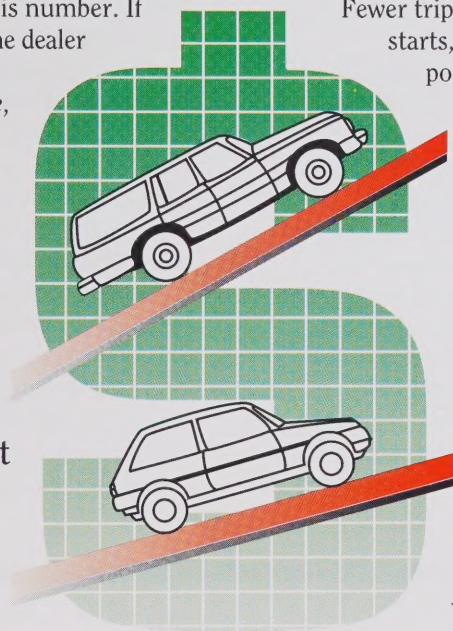
Annually

- ☐ Inspect brakes and exhaust system
- ☐ Tune engine fully (spark plugs, ignition wires, ignition cap, etc.)
- ☐ Replace fuel filter and PCV valve
- ☐ Lubricate throttle assembly
- ☐ Pressure-test cooling system
- ☐ Clean battery terminals
- ☐ Test potency of anti-freeze (-40° C)
- ☐ Test battery, alternator, charging system

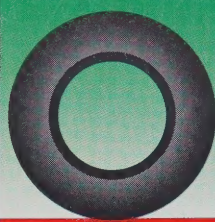
Every 2 years

(or 50,000 km)

- ☐ Flush cooling system
- ☐ Check shocks and struts
- ☐ Change transmission fluid and filter
- ☐ Check tire tread depth

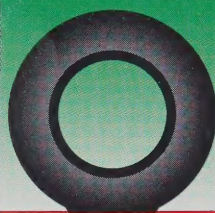


Over its lifetime, a larger car will consume thousands of litres more fuel than a small car and emit several extra tonnes of air pollution.



30,000 km

Cheaper tires usually wear down earlier.



50,000 km

Often, paying a little more means longer tire life.

The trick with tires is to make them last. You'll save money and fewer tires will enter the waste stream. Proper alignment prevents irregular tire wear, as does periodic rotation and tire inflation checks. When buying tires, check that the "treadwear rating" is high. Often, more expensive tires have higher ratings and are a better buy because they will long outlast cheaper models.

a few trips a week will make a difference. Walking and cycling with any regularity is healthier and will reduce your weight (along with your fuel bill). Not only will you be helping the environment, you'll be enjoying it.

Stay Auto\$mart

Regular auto maintenance is another winning economic and ecological strategy. The investment you make in keeping your car in top running order will pay off in lower fuel consumption and more years of use. And during its lifetime, a well-tuned car emits several tonnes less CO₂ and other pollutants.

Keeping tires properly inflated is the simplest tactic. Underinflated tires increase resistance between the car and the road. They reduce fuel efficiency and wear down the tire's tread prematurely. The difference in fuel efficiency between proper and improper tire pressure is about 5%. That's a lot. Get professionals to rotate and balance your tires twice a year and check that the front end is in alignment. Fuel efficiency drops further when these things are not taken care of.



Regular tune-ups are critical. Something as simple as a clogged \$15 air filter can reduce fuel efficiency by 10%. Furthermore, spark plugs build up carbon deposits, emission control systems lose efficiency, brakes can be secretly dragging on wheels, and air conditioners may be leaking ozone-destroying CFCs into the atmosphere.

An oil change should be your most frequent maintenance activity. Changing the oil purges tiny bits of metal that can harm engine parts, and fresh oil does a better job of lubricating, cooling, and protecting the engine against corrosion, thereby improving fuel economy. Re-refined motor oil is just as good for your car as virgin oil, and there's an environmental bonus: it reduces the need for crude oil to be taken from the ground. Recycling also helps prevent used oil from being dumped illegally. (One

Steps You Can Take Today

Being Auto\$mart is a matter of developing new habits – and looking at your car as a source of savings. It takes commitment. It takes perseverance. And it pays off. Remember these important Auto\$mart strategies:



Use your car less. Car pool with fellow commuters or parents. Ride a bicycle. Walk. Use public transit. Some families establish a "no car" radius of five to ten blocks around their home.



To test your ability to get around comfortably without your car consider a "No Car Week." Be resourceful. Share rides. Then calculate the savings – in money and pollution.



Post a car-pool notice at your office or any other place you travel to regularly. Someone who wants to share rides may live close by. You'll both save a significant amount.



If your family has two cars and one is more fuel efficient, try to use it for longer trips.



litre of motor oil when dispersed can contaminate 4.5 million litres of fresh water!) Look for Canada's EcoLogo on re-refined motor oils. On any oil you buy, look for the term "Energy Conserving II."

This denotes an additive that reduces engine friction and improves fuel efficiency.

High-octane gasoline is not necessarily an advantage for the vehicles most of us drive. Over one-third of all Canadian drivers use it under the mistaken impression that it's better for their cars. The truth is that higher octane fuels prevent engine "knocking," but *only* in high-performance engines. Unless your vehicle manual specifically states that octane is required, you are wasting money with these higher-priced fuels. Plus, high-octane fuels contain "aromatic hydrocarbons" that are harmful to our health.

Consider fuel alternatives that can save you money and reduce emissions. Most cars can easily be converted to natural gas or propane, an

especially good move for high-mileage vehicles. Vehicle manufacturers are now producing cars that operate on natural gas, propane, and methanol (an alcohol fuel). Ethanol-gasoline

blends, which can be used in gasoline-burning vehicles, are increasingly available at service stations. Check with fuel suppliers for information or call Auto\$mart at 1-800-387-2000.

Saver or spender? Know your options.

The options you choose in the showroom will affect your car's fuel efficiency for life.

Fuel-saving Options	Options with Little or No Effect on Fuel Economy	Options that Increase Fuel Consumption
<ul style="list-style-type: none"> • small engine • small turbocharged engine • manual transmission • overdrive (manual or automatic) • diesel engine • cruise control • fuel injection • fuel economy reminders (shift indicator lights) • block heater, preferably with timer 	<ul style="list-style-type: none"> • space-saver spare tire • exterior trim packages • tinted glass (on cars without air conditioning) • heavy-duty suspension 	<ul style="list-style-type: none"> • high-performance engine • turbocharged V8 engine • 4-barrel carburetor on a V8 engine • four-wheel drive • power brakes • power steering • air conditioning • power windows and seats • heated seats • sun roof • roof rack

When buying a new car, consider fuel-efficient models first. The smaller the engine, the less fuel it will consume. Less fuel means lower operating costs and fewer emissions.

Consider new-car options that improve fuel efficiency: manual transmission, overdrive, a block heater, and cruise control.

Consider alternative fuels. Natural gas and propane are cheaper than gasoline and produce lower levels of carbon monoxide and CO₂. Alcohol fuels like ethanol and methanol are also a greener option.

Plan your automobile outings. By combining several errands in one trip you'll save time. Your car will use less fuel and emit less pollution.

Avoid traffic by driving in off-peak hours. Starting and stopping in heavy traffic greatly reduces fuel efficiency and increases emissions.

Avoid idling. An idling engine gets zero kilometres per litre. Less fuel is required to restart your car than letting it idle for one minute. Half-an-hour of idling consumes roughly ½ a litre of gasoline, depending on the size of your engine.















Don't exceed the speed limit. On average, a vehicle uses about 20% more fuel at 110 km/hr than at 90 km/hr.

Keep your vehicle properly tuned and maintained. Improperly tuned cars can emit up to ten times the usual pollutants. Fuel consumption goes up too.

Call Auto\$mart at 1-800-387-2000 for your free *Car Economy Calculator*. Use it to keep a record of your car's fuel consumption.

Helpful Hints

The trick to being Auto\$mart is that many small actions amount to significant progress if repeated consistently over the years. Remember, there are two ways to save money – setting cash aside and avoiding costs. Cost-avoidance is often easier. By applying Auto\$mart techniques like these, your car won't cost you the world, and the world won't suffer as much.

-  If you use snow tires, install them as late as possible in the season and remove them as early as possible. They have an "aggressive" tread that increases fuel consumption.
-  Don't "top off" your tank to the brim when buying gasoline. The excess fuel will likely spill out due to natural expansion.
-  A diesel engine is a good choice. Diesel engines burn fuel more efficiently than gasoline engines. Plus, diesel fuel contains more energy and is usually cheaper.
-  Change your oil and oil filter frequently. Oil breaks down under use and won't lubricate, cool, or protect as well. Most car makers recommend an oil change every 3,000 kilometres. If you follow that schedule, your car will perform better.
-  Remove portable roof racks when they aren't being used. They increase aerodynamic drag and fuel consumption.
-  Improper wheel alignment will wear your tires prematurely. To check the alignment of your car, release the steering wheel at an even speed in a flat, empty parking lot. If the car veers to one side, chances are the alignment is out.
-  Learn to "flow" through traffic and avoid stops and starts that consume extra fuel. Maintain generous space between your car and the one ahead, and anticipate the movements of other vehicles so you can drive smoothly around them.
-  Don't "rev" the engine after start-up or before shutting your car off. It causes excessive wear and consumes fuel.
-  In warmer weather, try using the blowers and flow-through ventilation system rather than leaving windows open when driving on the highway. Open windows increase aerodynamic drag and fuel consumption.
-  Insist your mechanic check the emission-control system on your car during the next tune-up. Few do it as a matter of course, yet it's the only way you'll find out if the system is working.
-  If you have a manual transmission, remember that lower gears burn fuel faster. Always drive in a higher gear when appropriate.
-  Keep your tires properly inflated to maximize fuel efficiency. Check them at home with a pressure gauge while the tires are still cold. Warm tires give an inaccurate reading because inflation pressure increases during use.
-  Avoid "flooring" your gas pedal from a dead stop. You'll consume about 50% more fuel during a "jackrabbit" start than if you pull away gradually. Catalytic converters aren't able to handle the sudden surge of fuel, permitting more pollutants to escape from the tailpipe.
-  Look for oil products marked "Energy Conserving II." They contain additives that can increase fuel economy by 3%.

A large car that burns 14 litres of gasoline to travel 100 kilometres will emit 60 tonnes of CO₂ during its lifetime. A typical smaller car that burns 9 litres every 100 kilometres will emit only 38 tonnes of CO₂ over the same total distance. By choosing the more fuel-efficient car, you can save the environment 22 tonnes of CO₂. The savings in fuel is about 8,800 litres, which translates into approximately \$4,500. Think what *you* could do with that money. Vacations. Tuition. Retirement savings.



THE AUTO\$MART

\$? \$? \$?

QUIZ

\$? \$? \$?

How Auto\$mart are you? Take the following quiz to find out.

1. CO₂ emissions per vehicle have declined drastically over the past 20 years, but CO₂ from all cars is still rising. **T** ☐ **F** ☐
2. It is mandatory for automobile manufacturers to inform customers of the fuel efficiency rating on all new cars. **T** ☐ **F** ☐
3. No matter what model of car you buy, the options you choose will make a difference in its fuel consumption. **T** ☐ **F** ☐
4. Accelerating quickly from stops will always reduce the time it takes to get from one place to another. **T** ☐ **F** ☐
5. Driving fast reduces fuel consumption because you get to your destination in less time. **T** ☐ **F** ☐
6. In winter, it's smart to warm up your car for about five minutes so the engine doesn't strain with the cold. **T** ☐ **F** ☐
7. Using the drive-through window at a fast-food place is a better way to conserve fuel than shutting the car off, going in to get your food, and starting the car up again. **T** ☐ **F** ☐
8. The older your car, the less you can do to improve its fuel efficiency. **T** ☐ **F** ☐
9. Changing your oil regularly will reduce engine wear. **T** ☐ **F** ☐
10. When driving in warm weather at high speeds, it's more fuel efficient to use the air conditioner than the flow-through ventilation system in your car. **T** ☐ **F** ☐
11. An irregularly maintained car will produce emissions five to ten times greater than a car in proper running order. **T** ☐ **F** ☐
12. Recycled oil breaks down faster than "virgin" oil. **T** ☐ **F** ☐
13. Tire rotation is no longer necessary with modern radials. **T** ☐ **F** ☐
14. A dirty air filter causes the engine to labour but has no discernable effect on fuel efficiency. **T** ☐ **F** ☐
15. You can buy replaceable parts for your car, like spark plugs and reusable oil filters, that are of higher quality than the originals and will last for tens of thousands more miles. **T** ☐ **F** ☐
16. The ozone-destroying CFC coolant in your car's air conditioner can be collected and recycled. **T** ☐ **F** ☐
17. When the automatic shut-off valve on a gas pump signals that your tank is full, you should add just a little more. **T** ☐ **F** ☐
18. The Fuel Consumption Guide can help you compare the fuel efficiency of cars you're considering buying. **T** ☐ **F** ☐
19. There are over 35,000 vehicles running on natural gas in Canada. **T** ☐ **F** ☐
20. Using high-octane gasoline makes your car last longer. **T** ☐ **F** ☐

Answers

20. F
15. T; 16. T; 17. F; 18. T; 19. T;
11. T; 12. F; 13. F; 14. F;
6. F; 7. F; 8. F; 9. T; 10. F;
1. T; 2. T; 3. T; 4. F; 5. F;

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Take the Auto\$mart pledge.

Join thousands of Canadians in making a cleaner, brighter future for everyone. Commit to the Auto\$mart movement. When we hit the Auto\$mart road together, the environment wins, and so do we.

For more information, please call:

The Auto\$mart Line
1-800-387-2000



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